

### **REMARKS/ARGUMENTS**

Favorable reconsideration of this application, in light of the following discussion, is respectfully requested.

Claims 1 and 3-5 are pending in the present application.

In the outstanding Office Action, Claims 1 and 3-5 were rejected under 35 U.S.C. § 103(a) as unpatentable over Friday et al. (U.S. Patent No. 6,183,627, herein "Friday").

Initially, Applicants and Applicants' representatives wish to thank Examiner W. D. Griffin for the personal interview on November 30, 2005. During the interview the outstanding rejections and Applicants' arguments presented in the last response were discussed in detail. However, the Examiner was not convinced by the Applicants' arguments that the step of the solvent deasphalting in Friday is **a required step**; that the elimination of that step from the process of Friday would change the operation of the process; and that the elimination therefore would not be obvious. Accordingly, the Examiner maintained his position stating that such an elimination of the step is obvious for reasons of record.

Based on the results of the personal interview, the present response sets forth the discussion below to traverse the rejection of the claims.

First, with regard to the above-noted position of the Examiner that an elimination of a required step in Friday is obvious, it is respectfully submitted that no legal basis is found to support such position. In the outstanding Office Action, the Examiner relies on Ex parte Wu to support his obviousness arguments. However, MPEP 2144.04 clearly states in section II. A. "Omission of an Element and Its Function Is Obvious If the Function of the Element Is Not Desired" as follows:

*Ex parte Wu*, 10 USPQ 2031 (Bd. Pat. App. & Inter. 1989) (... The Board affirmed the rejection, holding that it would have been **obvious to omit** the polybasic acid salts of the primary reference **where the function** attributed to such salt **is not desired or required**, such as

in compositions for providing corrosion resistance in environments which do not encounter fresh water.).

Further, MPEP 2143.01 clearly states that a required step cannot be obvious in section V. "THE PROPOSED MODIFICATION CANNOT RENDER THE PRIOR ART UNSATISFACTORY FOR ITS INTENDED PURPOSE" as follows:

***If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984) (... The Board concluded the claims were prima facie obvious, reasoning that it would have been obvious to turn the reference device upside down. The court reversed, finding that if the prior art device was turned upside down **it would be inoperable for its intended purpose** because the gasoline to be filtered would be trapped at the top, the water and heavier oils sought to be separated would flow out of the outlet instead of the purified gasoline, and the screen would become clogged.).***

Therefore, Applicants' position that the elimination of the required step of the solvent deasphalting in Friday cannot be obvious is clearly supported by MPEP and case law as noted above. It is noted that mere conclusions completely lacking any established authority cannot form the basis for making any rejection. See In re Lee, 277 F.3d 1338, 1344-45, 61 USPQ2d 1430, 1434-35 (Fed. Cir. 2002) ("This factual question of motivation is material to patentability, and [cannot] be resolved on subjective belief and unknown authority.").

Moreover, Applicants respectfully submit additional discussions to further clarify why the elimination of the required step of the solvent deasphalting in Friday cannot be obvious. Specifically, the discussion below is presented in response to the following assertion in the outstanding Office Action:

Additionally, it would have been obvious to eliminate the solvent deasphalting step of Friday because the removal of asphaltenes permits the operation of the cracker at more severe conditions and higher conversion. If one could put up with lesser conversion with reduced costs from the elimination of the deasphalting step, one would be motivated to eliminate the

deasphalting step. Also, by eliminating this step, residues of coke and pitch would be produced.

In this regard, the residue thermal cracking in Friday ***does not teach having a device for removing coke or pitch.*** Such thermal cracking is known as a mild thermal cracking which includes solvent deasphalting where the severity of residue cracking is mild. Because the mild thermal cracking in Friday occurs in the liquid phase, and cracked light product is ***not separated*** from residue remaining in the same liquid phase, ***residual fuel oil is produced as well as cracked gas, distillate oil.*** In such mild thermal cracking, the reaction is mild; and the reaction is kept in a liquid phase.

In contrast, the present invention recited in Claim 1 includes the step of thermally cracking the heavy oil content obtained directly from a bottom of the distilling section ***so that a lightened thermally cracked product and residues of pitch or coke are produced.*** In this regard, the residue thermal cracking in the present invention recited in Claim 1 ***has a device for removing coke or pitch.***<sup>1</sup> Accordingly, the severity of residue cracking is maximized (i.e., ***the severity is higher than the mild thermal cracking in Friday***). In such a process, since the cracked light product is vaporized and ***separated*** from liquid phase of cracked residue that will eventually become coke or pitch, the residue conversion to light product is maximized ***so that cracked gas, distillate oil and coke or pitch are produced but no residual fuel oil is produced.***<sup>2</sup>

Further, as described in Friday at column 3, lines 36-56, the mild thermal cracking in Friday requires that the process must avoid fouling as much as possible due to condensation and coking reactions, when increasing a reaction severity. That is because the invention in Friday, like other inventions relating to the mild thermal cracking process, ***does not utilize a***

---

<sup>1</sup> See, e.g., the thermal cracking section (20) shown in Fig. 1.

<sup>2</sup> See the present specification at page 11, lines 4-11, page 12, lines 8-19, and Fig. 1, for example.

*device for removing coke or pitch* during the process. Therefore, *coke or pitch cannot be produced*. Accordingly, if the solvent deasphalting step is eliminated from Friday, a condensed large molecule produced in a thermal cracking reaction is recycled and *accumulated* in the processing system of Friday because there is *no way for it to be drawn off* from the processing system. As a result, if the solvent deasphalting step is eliminated in Friday, residues of coke or pitch would *accumulate* in the processing system. The accumulation of such a condensed large molecule that is unstable makes the thermal cracking process less severe and would *result in heavy fouling and deposition of coke or pitch* causing the processing system to stop operating. Accordingly, in Friday, the solvent deasphalting step provides an essential function without which the processing system cannot operate.

In contrast, in the present invention recited in Claim 1, the severity of residue cracking is not adjusted because the level of residue conversion to light product is maximized; thus, no fuel residual oil is produced. Further, deasphalting is not necessary; and the use of a hydrogen donor is also not necessary.

Also, the present invention recited in Claim 1 *utilizes a device for removing coke or pitch* during the process; therefore, *coke or pitch is produced and drawn off* from the processing system through the above-noted removing device. Since the thermal cracking process of the present invention is to be utilized not for selective reactions to certain products, but for a broad range of productions from light to heavy materials including coke precursors with the above-noted condensed large molecule, the feature of drawing off the heavy materials from the processing system with a thermal cracking is essential at the more severe conditions and higher conversion. Such intended production of coke or pitch is clearly *different from unintended accumulation* of coke or pitch in Friday because no problems,

such as fouling and deposition of coke or pitch, occur as the coke or pitch produced is drawn off from the processing system of the present invention utilizing the above-noted removing device.

In light of the foregoing discussions, it is believed to be clear that it would not have been obvious to one having ordinary skill in the art to eliminate the solvent deasphalting step and to modify other features of Friday as suggested in the outstanding Office Action.

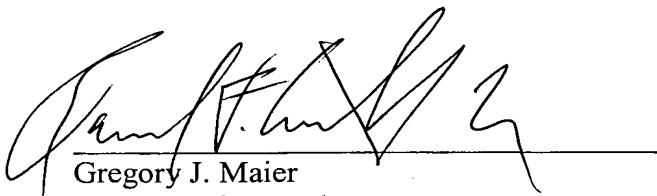
Accordingly, Applicants respectfully request the withdrawal of the rejection of Claim 1.

Claims 3-5 are considered allowable at least for the above reasons advanced for Claim 1 from which they depend.

As no other issues are pending in this application, it is respectfully submitted that the present application is now in condition for formal allowance, and it is hereby respectfully requested that this case be passed to issue.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.

A handwritten signature in black ink, appearing to read 'Gregory J. Maier', is written over a horizontal line.

Gregory J. Maier  
Attorney of Record  
Registration No. 25,599

Customer Number  
**22850**

Tel: (703) 413-3000  
Fax: (703) 413 -2220  
(OSMMN 08/03)

Raymond F. Cardillo, Jr.  
Registration No. 40,440